CITY OF MIDVALE (PWS 3440007)
SOURCE WATER ASSESSMENT FINAL REPORT

May 9, 2001

State of Idaho
Department of Environmental Quality

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Executive Summary

Under the Safe Drinking Water Act Amendments of 1996, all states are required by the U.S. Environmental Protection Agency to assess every source of public drinking water for its relative sensitivity to contaminants regulated by the Act. This assessment is based on a land use inventory of the designated assessment area and sensitivity factors associated with the wells and aquifer characteristics.

This report, *Source Water Assessment for City of Midvale, Idaho,* describes the public drinking water system, the boundaries of the zones of water contribution, and the associated potential contaminant sources located within these boundaries. This assessment should be used as a planning tool, taken into account with local knowledge and concerns, to develop and implement appropriate protection measures for this source. **The results should <u>not be</u> used as an absolute measure of risk and they should <u>not be</u> used to undermine public confidence in the water system.**

The City of Midvale drinking water system consists of two ground water sources. Well #1 is the primary well and Well #2 is the backup source. Both wells have moderate ratings for hydrologic sensitivity and high ratings for system construction. These and other factors, including an enhanced inventory of potential contaminant sources, led to an overall high susceptibility to inorganic contamination, volatile organic contamination, synthetic organic contamination, and microbial contamination. Current water chemistry tests have recorded no significant problems with the well water, though the potential for contamination remains.

This assessment should be used as a basis for determining appropriate new protection measures or re-evaluating existing protection efforts. No matter what ranking a source receives, protection is always important. Whether the source is currently located in a "pristine" area or an area with numerous industrial and/or agricultural land uses that require education and surveillance, the way to ensure good water quality in the future is to act now to protect valuable water supply resources.

For the City of Midvale, source water protection activities should focus on implementation of best management practices aimed at protecting the wellheads and surface seals within the zone immediate to the wells. Deficiencies noted in the 1997 Sanitary Survey that haven't been corrected should be. Urban and residential runoff should be monitored. Spills and accidents from businesses or major transportation corridors within the jurisdiction of the City should be closely monitored and dealt with. Practices aimed at reducing the leaching of agricultural chemicals should be implemented. Disinfection practices should be maintained to reduce the risk of microbial contamination, which have been recorded at various points of the distribution system in 1993. Some of the source water protection designated areas are outside the direct jurisdiction of the City of Midvale. Partnerships with state and local agencies and industry groups should be established and are critical to success. Due to the time involved with the movement of ground water, source water protection activities should be aimed at long-term management strategies even though these strategies may not yield results in the near term. Source water protection activities for agriculture should be coordinated with the Idaho State Department of Agriculture, the Soil Conservation Commission, the local Soil and Water Conservation District, and the Natural Resources Conservation Service.

A community with a fully developed source water protection program will incorporate many strategies. For assistance in developing protection strategies please contact the Boise Regional Office of the Idaho Department of Environmental Quality or the Idaho Rural Water Association.

SOURCE WATER ASSESSMENT FOR CITY OF MIDVALE, IDAHO

Section 1. Introduction - Basis for Assessment

The following sections contain information necessary to understand how and why this assessment was conducted. **It is important to review this information to understand what the ranking of this source means.** A map showing the delineated source water assessment area and the inventory of significant potential sources of contamination identified within that area are attached. The list of significant potential contaminant source categories and their rankings used to develop the assessment also is attached.

Background

Under the Safe Drinking Water Act Amendments of 1996, all states are required by the U.S. Environmental Protection Agency (EPA) to assess every source of public drinking water for its relative susceptibility to contaminants regulated by the Safe Drinking Water Act. This assessment is based on a land use inventory of the delineated assessment area and sensitivity factors associated with the wells and aquifer characteristics.

Level of Accuracy and Purpose of the Assessment

Since there are over 2,900 public water sources in Idaho, there is limited time and resources to accomplish the assessments. All assessments must be completed by May of 2003. An in-depth, site-specific investigation of each significant potential source of contamination is not possible. **Therefore, this assessment should be used as a planning tool, taken into account with local knowledge and concerns, to develop and implement appropriate protection measures for this source. The results should <u>not be</u> used as an absolute measure of risk and they should <u>not be</u> used to undermine public confidence in the water system.**

The ultimate goal of the assessment is to provide data to local communities to develop a protection strategy for their drinking water supply system. The Idaho Department of Environmental Quality (DEQ) recognizes that pollution prevention activities generally require less time and money to implement than treatment of a public water supply system once it has been contaminated. DEQ encourages communities to balance resource protection with economic growth and development. The decision as to the amount and types of information necessary to develop a source water protection program should be determined by the local community based on its own needs and limitations. Wellhead or source water protection is one facet of a comprehensive growth plan, and it can complement ongoing local planning efforts.

Section 2. Conducting the Assessment

General Description of the Source Water Quality

The City of Midvale wells are community wells that serve approximately 150 people with approximately 120 connections. The wells are located in Washington County, near the intersection of Bridge Road and River Street (Figure 1). The public drinking water system for the City of Midvale is comprised of two wells.

No significant water chemistry problems have been recorded in the public water system. Total coliform bacteria and *E-coli* bacteria were detected in the distribution system in 1993. The inorganic contaminants (IOCs) arsenic and fluoride have been detected, but at levels below the Maximum Contaminant Level (MCL). No detections of volatile organic contaminants (VOCs) or synthetic organic contaminants (SOCs) have been recorded.

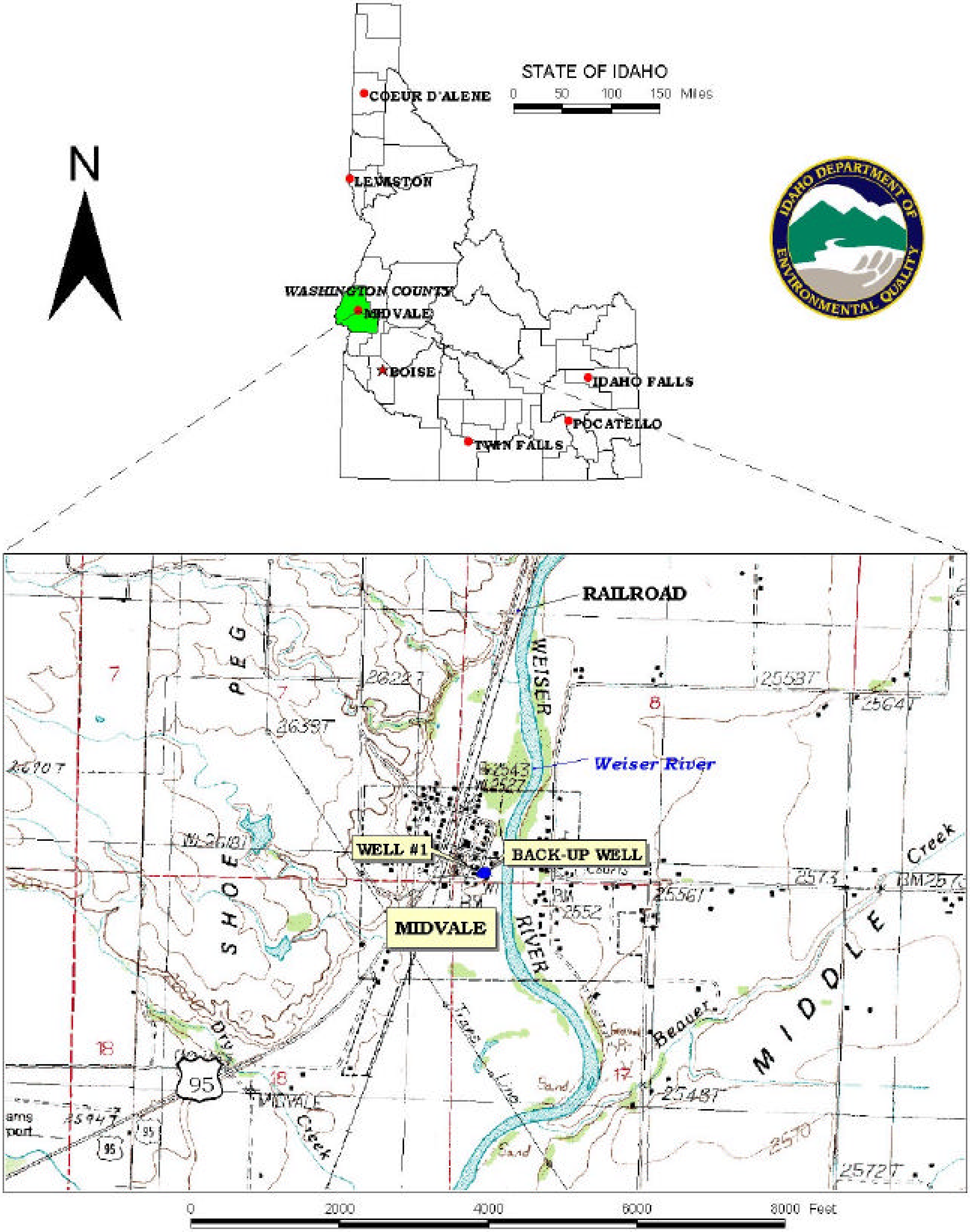
Defining the Zones of Contribution – Delineation

The delineation process establishes the physical area around a well that will become the focal point of the assessment. The process includes mapping the boundaries of the zone of contribution into time-of-travel (TOT) zones (zones indicating the number of years necessary for a particle of water to reach a well) for water in the aquifer. DEQ used a refined computer model approved by the EPA in determining the 3-year (Zone 1B), 6-year (Zone 2), and 10-year (Zone 3) TOT for water associated with the Columbia River Basalt aquifer that is being pumped by the Backup Well. The computer model used site specific data, assimilated by DEQ from a variety of sources including the City of Midvale well logs, other local area well logs, and hydrogeologic reports summarized below.

In situations where insufficient information was available (Well #1), the capture zones were delineated using a calculated fixed radius method. This method utilized assumed aquifer parameters for the Columbia River Basalt (Appendix F, Idaho Wellhead Protection Plan), in combination with well-specific information where available, such as well discharge rate and estimates of the thickness of the formation.

The wells of the City of Midvale system take their water from the fractured aquifer of the Columbia River Basalt. Geologic formations associated with basalt of the Columbia Plateau are known to yield as much as several hundred gallons per minute (gpm) (IDWA, 1966). The Columbia River basalts are dense, exhibit columnar jointing in many places, and are folded and faulted leading to many fracture zones where ground water may collect (Whitehead and Parliman, 1979). Basalt flows fracture at the surface as they cool. The fractures occur in the horizontal direction throughout the flow. Regional fractures hundreds or thousands of feet long may intersect several flows and have widely varying widths (Lum et al., 1990). The aquifer thickness ranges from 20 to 800 feet and the transmissivity ranges from 2,700 ft^2/day to 270,000 ft^2/day (Barker, 1979; Cohen and Ralston, 1980). Locally, a single basalt flow underlies the entire area making a determination of local ground water movement difficult to ascertain. Regional ground water recharge appears to follow the Weiser River valley from north to south.

FIGURE 1. Geographic Location of the Midvale Water System



The delineated source water assessment area for City of Midvale Well #1 can best be described as a group of circles with radii of 1,920 feet (3-year TOT), 2,720 feet (6-year TOT), and 3,510 feet (10-year TOT). The Back-up Well delineation is approximately circular with similar radii, though there is a slight distortion to the northeast (Figures 2, 3). The actual data used by DEQ in determining the source water assessment delineation areas are available upon request.

Identifying Potential Sources of Contamination

A potential source of contamination is defined as any facility or activity that stores, uses, or produces, as a product or by-product, the contaminants regulated under the Safe Drinking Water Act and has a sufficient likelihood of releasing such contaminants at levels that could pose a concern relative to drinking water sources. The goal of the inventory process is to locate and describe those facilities, land uses, and environmental conditions that are potential sources of ground water contamination. The locations of potential sources of contamination within the delineation areas were obtained by field surveys conducted by DEQ and from available databases.

The dominant land use outside the City of Midvale area is irrigated agriculture. Land use within the immediate area of the wellheads consists of residential subdivisions, urban and commercial uses, septic systems, a livestock holding area, and the Weiser River.

It is important to understand that a release may never occur from a potential source of contamination provided they are using best management practices. Many potential sources of contamination are regulated at the federal level, state level, or both to reduce the risk of release. Therefore, when a business, facility, or property is identified as a potential contaminant source, this should not be interpreted to mean that this business, facility, or property is in violation of any local, state, or federal environmental law or regulation. What it does mean is that the potential for contamination exists due to the nature of the business, industry, or operation. There are a number of methods that water systems can use to work cooperatively with potential sources of contamination. These involve educational visits and inspections of stored materials. Many owners of such facilities may not even be aware that they are located near a public water supply well.

Contaminant Source Inventory Process

A two-phased contaminant inventory of the study area was conducted from December 2000 to April 2001. The first phase involved identifying and documenting potential contaminant sources within the City of Midvale Source Water Assessment Area through the use of computer databases and Geographic Information System maps developed by DEQ. The second, or enhanced, phase of the contaminant inventory involved contacting the operator to validate the sources identified in phase one and to add any additional potential sources in the area. This task was undertaken with the assistance of Jack Piper.

Since the delineated source water protection areas are nearly the same, both wells have nearly the same number and type of potential contaminant sources. There are eleven (11) potential contaminant sites for Well #1 and ten (10) potential contaminant sites for the Back-up Well. Both delineations also have two major transportation corridors (Tables 1 and 2). The sources include two petroleum underground storage tanks (USTs), old garages and gas staions, the city landfill, the school agricultural shop, a livestock equipment and supply store, and a sand and gravel pit. Additionally Highway 95 and the Union Pacific Railroad cross the delineation, which are potential sources for all types of contaminants. Figures 2 and 3 show the locations of these various potential contaminant sites relative to the wellheads.

Table 1. City of Midvale Well #1, Potential Contaminant Inventory

SITE #	Source Description[1]	TOT Zone[2] (years)	Source of Information	Potential Contaminants[3]
1	UST – open	0-3	Database Search	VOC, SOC
2	UST – gas station, closed	0-3	Database Search	VOC, SOC
3	Sand and Gravel mine	0-3	Database Search	IOC, VOC, SOC
4	Old Gas Station	0-3	Enhanced Inventory	VOC, SOC
5	Old Garage	0-3	Enhanced Inventory	IOC, VOC, SOC
6	Old Bulk Plant	0-3	Enhanced Inventory	IOC, VOC, SOC
7	Old Garage	0-3	Enhanced Inventory	VOC, SOC
8	Landfill – city	0-3	Enhanced Inventory	IOC, VOC, SOC, Microbial
9	Old Garage	0-3	Enhanced Inventory	IOC, VOC, SOC
10	School Agriculture Shop	0-3	Enhanced Inventory	IOC, VOC, SOC, Microbial
11	Livestock Equipment and Supplies	6-10	Database Search	IOC, VOC, SOC, Microbial
	Highway 95	0-10	GIS map	IOC, VOC, SOC, Microbial
	Railroad	0-10	GIS map	IOC, VOC, SOC, Microbial

[1] UST = underground storage tank,
[2] TOT = time-of-travel (in years) for a potential contaminant to reach the wellhead
[3] IOC = inorganic chemical, VOC = volatile organic chemical, SOC = synthetic organic chemical

FIGURE 2. Midvale Water System Delineation Map and Potential Contaminant Source Locations

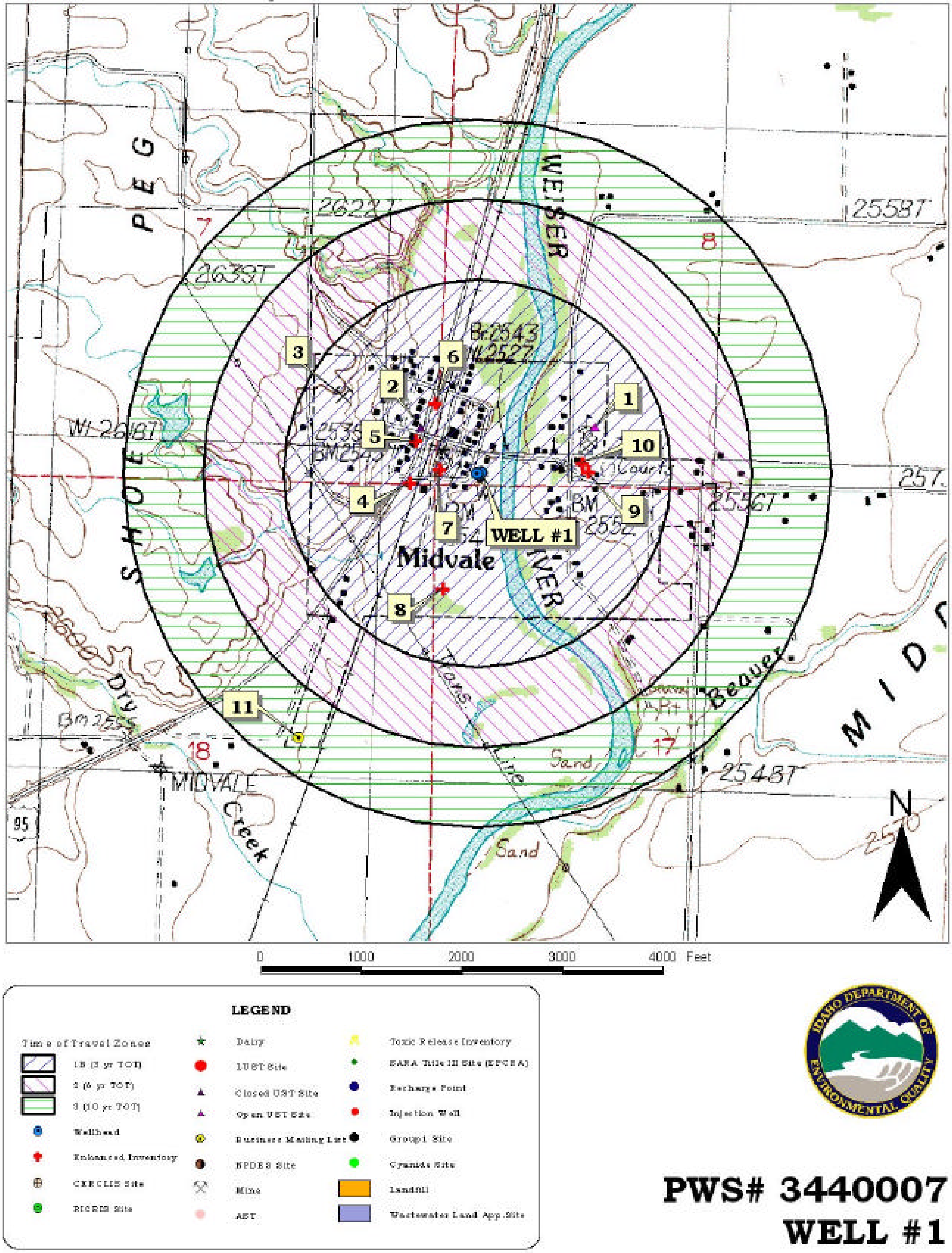
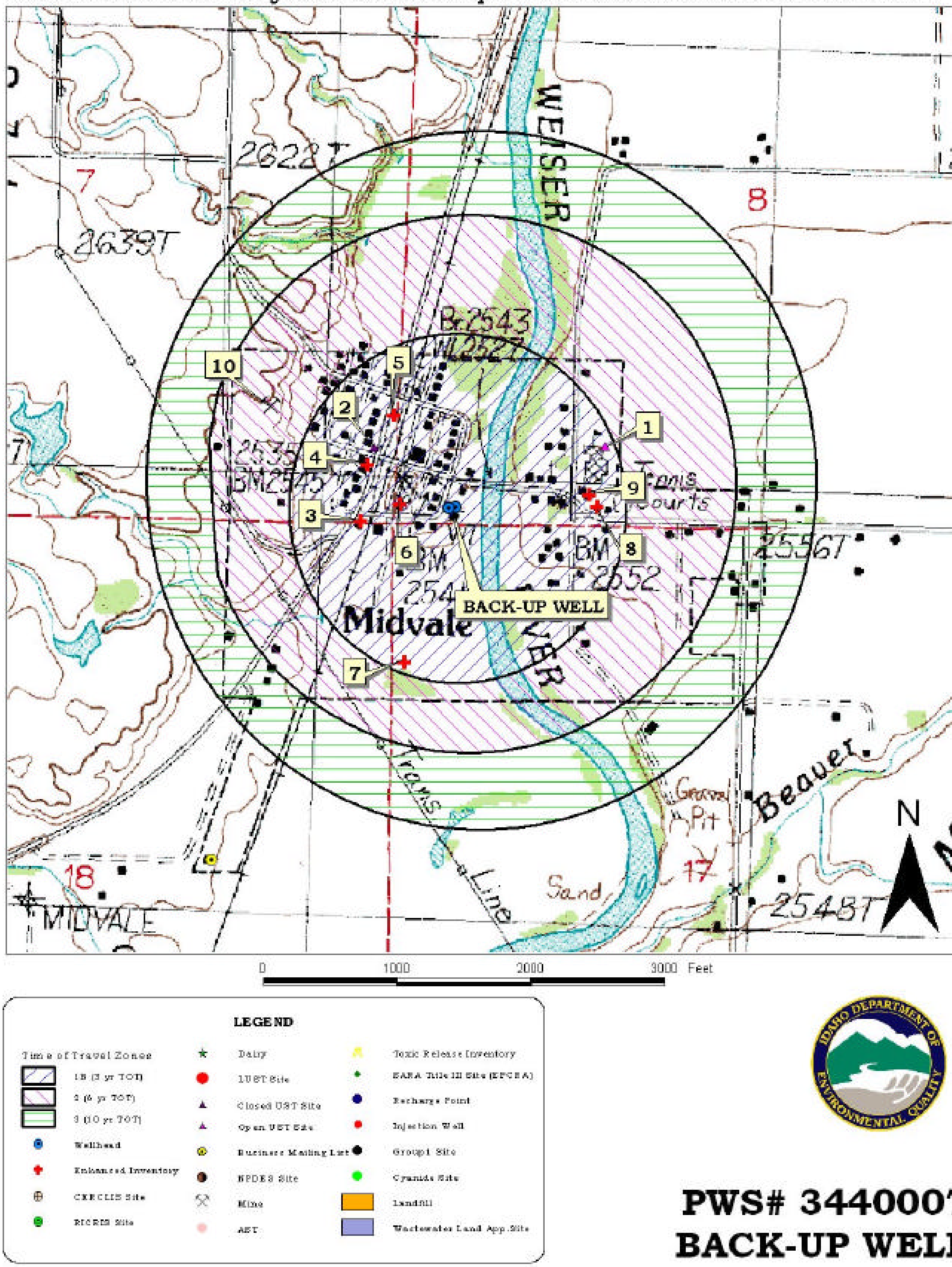


FIGURE 3. Midvale Water System Delineation Map and Potential Contaminant Source Locations



PWS# 3440007
BACK-UP WELL

Table 2. City of Midvale Backup Well, Potential Contaminant Inventory

SITE #	Source Description[1]	TOT Zone[2] (years)	Source of Information	Potential Contaminants[3]
1	UST – open	0-3	Database Search	VOC, SOC
2	UST – gas station, closed	0-3	Database Search	VOC, SOC
3	Old Gas Station	0-3	Enhanced Inventory	VOC, SOC
4	Old Garage	0-3	Enhanced Inventory	IOC, VOC, SOC
5	Old Bulk Plant	0-3	Enhanced Inventory	IOC, VOC, SOC
6	Old Garage	0-3	Enhanced Inventory	VOC, SOC
7	Landfill – city	0-3	Enhanced Inventory	IOC, VOC, SOC, Microbial
8	Old Garage	0-3	Enhanced Inventory	IOC, VOC, SOC
9	School Agriculture Shop	0-3	Enhanced Inventory	IOC, VOC, SOC, Microbial
10	Sand and Gravel mine	3-6	Database Search	IOC, VOC, SOC
	Highway 95	0-10	GIS map	IOC, VOC, SOC, Microbial
	Railroad	0-10	GIS map	IOC, VOC, SOC, Microbial

[1] UST = underground storage tank,
[2] TOT = time-of-travel (in years) for a potential contaminant to reach the wellhead
[3] IOC = inorganic chemical, VOC = volatile organic chemical, SOC = synthetic organic chemical

Section 3. Susceptibility Analyses

The water system's susceptibility to contamination was ranked as high, moderate, or low risk according to the following considerations: hydrologic characteristics, physical integrity of the well, land use characteristics, and potentially significant contaminant sources. The susceptibility rankings are specific to a particular potential contaminant or category of contaminants. Therefore, a high susceptibility rating relative to one potential contaminant does not mean that the water system is at the same risk for all other potential contaminants. The relative ranking that is derived for each well is a qualitative, screening-level step that, in many cases, uses generalized assumptions and best professional judgement. The following summaries describe the rationale for the susceptibility ranking.

Hydrologic Sensitivity

The hydrologic sensitivity of a well is dependent upon four factors: the surface soil composition, the material in the vadose zone (between the land surface and the water table), the depth to first ground water, and the presence of a 50-foot thick fine-grained zone above the producing zone of the well. Slowly draining soils such as silt and clay typically are more protective of ground water than coarse-grained soils such as sand and gravel. Similarly, fine-grained sediments in the subsurface and a water depth of more than 300 feet protect the ground water from contamination.

Hydrologic sensitivity was moderate for the two wells (Table 3). This reflects the nature of the soils being in the moderately-drained to well-drained class, the vadose zone (zone from land surface to the water table) being made predominantly of sand and gravel, and the first ground water being located within 300 feet of ground surface. Reducing the score from high occurred because the wells have laterally extensive low permeability units that could retard downward movement of contaminants.

Well Construction

Well construction directly affects the ability of the well to protect the aquifer from contaminants. The City of Midvale drinking water system consists of two wells that extract ground water for residential, commercial, and industrial uses. The well system construction scores were high for both wells.

A sanitary survey for the two wells was completed in June 1997 to determine if the wells were in compliance with wellhead and surface seal standards. Well #1 has a concrete block well house, while the Back-up well has a wood frame well house. Although the well casing in the wells is above grade, the close proximity of the Weiser River puts the wellheads in danger of flooding. Neither of the wells has a maintained wellhead seal or a downturned, screened casing vent.

Well logs were available for both the wells, so a determination was made as to whether the casing and annular seals had been extended into low permeability units and whether current public water system (PWS) construction standards were being met. Well #1 was originally drilled in 1962 and then deepened in 1983. There is no listing of the depth of the annular seal. The well has 0.375-inch thick, 12-inch diameter steel casing from ground surface to 435 feet below ground surface (bgs) into a basalt layer. There is 0.250-inch thick, 8-inch diameter casing installed from 2 feet bgs to 963 feet bgs. The well flows with artesian pressure. Though the well may have been in compliance with standards when it was drilled in 1962 and deepened in 1983, current PWS well construction standards are more stringent.

The Back-up well was drilled in 1953 to a depth of 320 feet into a blue clay layer. There is no listing on the log of the depth of the annular seal. The well has 0.375-inch thick, 12-inch diameter casing from ground surface to 295 feet bgs with 8-inch diameter casing to the bottom of the hole. Perforated casing was added between 60 feet bgs and 295 feet bgs. The water table was identified at 9 feet bgs. Though the well may have been in compliance with standards when it was drilled in 1953, current PWS well construction standards are more stringent.

The IDWR *Well Construction Standards Rules* (1993) require all PWSs to follow DEQ standards as well. IDAPA 58.01.08.550 requires that PWSs follow the *Recommended Standards for Water Works* (1997) during construction. Table 1 of the *Recommended Standards for Water Works* (1997) lists the required steel casing thicknesses for various diameter wells. Twelve-inch diameter casing on wells requires a casing thickness of at least 0.375-inches. Well #1 uses 0.250-inch thick casing. The surface seal must be installed into a low permeability unit. No information was available about the depths of the surface seals.

Potential Contaminant Sources and Land Use

The wells rated high for IOCs (i.e. nitrates), VOCs (i.e. petroleum products), and SOCs (i.e. pesticides), and moderate for and microbial contaminants. Commercial, industrial, and agricultural land uses in the delineated source areas contributed the largest numbers of IOC, VOC, and SOC points to the contaminant inventory rating. Microbial contaminants were contributed from the transportation corridors, the landfill, which potentially could have accidental spills, and from the agricultural shop and the livestock supply company.

Final Susceptibility Ranking

A detection above a drinking water standard MCL or a detection of total coliform bacteria or fecal coliform bacteria at the wellhead will automatically give a high susceptibility rating to a well despite the land use of the area because a pathway for contamination already exists. Hydrologic sensitivity and system construction scores are heavily weighted in the final scores. Having multiple potential contaminant sources in the 0 to 3-year time of travel zone (Zone 1B) and a large percentage of agricultural land contribute greatly to the overall ranking. Though bacterial contamination was detected in the distribution system, it has never been detected at the wellhead, so the wells do not automatically rate as high susceptibility. In terms of total susceptibility, both wells rate high for all categories.

Table 3. Summary of City of Midvale Susceptibility Evaluation

Well	Susceptibility Scores[1]									
	Hydrologic Sensitivity	Contaminant Inventory				System Construction	**Final Susceptibility Ranking**			
		IOC	VOC	SOC	Microbials		IOC	VOC	SOC	Microbials
Well #1	M	H	H	H	M	H	H	H	H	H
Back-up Well	M	H	H	H	M	H	H	H	H	H

[1]H = High Susceptibility, M = Moderate Susceptibility, L = Low Susceptibility,
IOC = inorganic chemical, VOC = volatile organic chemical, SOC = synthetic organic chemical

Susceptibility Summary

Due mainly to the high system construction scores and the numerous potential contaminant sites, the final susceptibility rating was high in all categories for both wells.

No significant water chemistry problems have been recorded in the well water, though total and fecal coliform bacteria were detected in the distribution system in 1993. The IOCs flouride and arsenic have been detected, but at levels below the MCL. No detections of VOCs or SOCs have been recorded. Though the delivered water is currently safe, there is the potential for contamination from the local point sources and from agricultural practices.

Section 4. Options for Source Water Protection

The susceptibility assessment should be used as a basis for determining appropriate new protection measures or re-evaluating existing protection efforts. No matter what the susceptibility ranking a source receives, protection is always important. Whether the source is currently located in a “pristine” area or an area with numerous industrial and/or agricultural land uses that require education and surveillance, the way to ensure good water quality in the future is to act now to protect valuable water supply resources.

An effective source water protection program is tailored to the particular local source water protection area. A community with a fully developed source water protection program will incorporate many strategies. For the City of Midvale, source water protection activities should focus on implementation of best management practices aimed at protecting the wellheads and surface seals within the zone immediate to the wells. Deficiencies noted in the 1997 Sanitary Survey should be corrected if they have not been to date. Urban and residential runoff should be monitored. Spills and accidents from businesses or major transportation corridors within the jurisdiction of the City should be closely monitored and dealt with. Practices aimed at reducing the leaching of agricultural chemicals should be implemented. Disinfection practices should be maintained to reduce the risk of microbial contamination which have been recorded at various points of the distribution system in 1993. Some of the designated source water protection areas are outside the direct jurisdiction of the City of Midvale. Partnerships with state and local agencies and industry groups should be established and are critical to success. Continued vigilance in keeping the well protected from surface flooding can also keep the potential for contamination reduced. Due to the time involved with the movement of ground water, wellhead protection activities should be aimed at long-term management strategies even though these strategies may not yield results in the near term. Source water protection activities for agriculture should be coordinated with the Idaho State Department of Agriculture, the Soil Conservation Commission, the local Soil and Water Conservation District, and the Natural Resources Conservation Service.

Assistance

Public water supplies and others may call the following DEQ offices with questions about this assessment and to request assistance with developing and implementing a local protection plan. In addition, draft protection plans may be submitted to the DEQ office for preliminary review and comments.

Boise Regional DEQ Office	(208) 373-0550
State DEQ Office	(208) 373-0502

Website: http://www2.state.id.us/deq

Water suppliers serving fewer than 10,000 persons may contact John Bokor, Idaho Rural Water Association, at 1-800-962-3257 for assistance with wellhead protection strategies.

POTENTIAL CONTAMINANT INVENTORY
LIST OF ACRONYMS AND DEFINITIONS

AST (Aboveground Storage Tanks) – Sites with aboveground storage tanks.

Business Mailing List – This list contains potential contaminant sites identified through a yellow pages database search of standard industry codes (SIC).

CERCLIS – This includes sites considered for listing under the **Comprehensive Environmental Response Compensation and Liability Act (CERCLA)**. CERCLA, more commonly known as ASuperfund≅ is designed to clean up hazardous waste sites that are on the national priority list (NPL).

Cyanide Site – DEQ permitted and known historical sites/facilities using cyanide.

Dairy – Sites included in the primary contaminant source inventory represent those facilities regulated by Idaho State Department of Agriculture (ISDA) and may range from a few head to several thousand head of milking cows.

Deep Injection Well – Injection wells regulated under the Idaho Department of Water Resources generally for the disposal of stormwater runoff or agricultural field drainage.

Enhanced Inventory – Enhanced inventory locations are potential contaminant source sites added by the water system. These can include new sites not captured during the primary contaminant inventory, or corrected locations for sites not properly located during the primary contaminant inventory. Enhanced inventory sites can also include miscellaneous sites added by the Idaho Department of Environmental Quality (DEQ) during the primary contaminant inventory.

Floodplain – This is a coverage of the 100year floodplains.

Group 1 Sites – These are sites that show elevated levels of contaminants and are not within the priority one areas.

Inorganic Priority Area – Priority one areas where greater than 25% of the wells/springs show constituents higher than primary standards or other health standards.

Landfill – Areas of open and closed municipal and non-municipal landfills.

LUST (Leaking Underground Storage Tank) – Potential contaminant source sites associated with leaking underground storage tanks as regulated under RCRA.

Mines and Quarries – Mines and quarries permitted through the Idaho Department of Lands.)

Nitrate Priority Area – Area where greater than 25% of wells/springs show nitrate values above 5mg/l.

NPDES (National Pollutant Discharge Elimination System) – Sites with NPDES permits. The Clean Water Act requires that any discharge of a pollutant to waters of the United States from a point source must be authorized by an NPDES permit.

Organic Priority Areas – These are any areas where greater than 25 % of wells/springs show levels greater than 1% of the primary standard or other health standards.

Recharge Point – This includes active, proposed, and possible recharge sites on the Snake River Plain.

RICRIS – Site regulated under **Resource Conservation Recovery Act (RCRA)**. RCRA is commonly associated with the cradle to grave management approach for generation, storage, and disposal of hazardous wastes.

SARA Tier II (Superfund Amendments and Reauthorization Act Tier II Facilities) – These sites store certain types and amounts of hazardous materials and must be identified under the Community Right to Know Act.

Toxic Release Inventory (TRI) – The toxic release inventory list was developed as part of the Emergency Planning and Community Right to Know (Community Right to Know) Act passed in 1986. The Community Right to Know Act requires the reporting of any release of a chemical found on the TRI list.

UST (Underground Storage Tank) – Potential contaminant source sites associated with underground storage tanks regulated as regulated under RCRA.

Wastewater Land Applications Sites – These are areas where the land application of municipal or industrial wastewater is permitted by DEQ.

Wellheads – These are drinking water well locations regulated under the Safe Drinking Water Act. They are not treated as potential contaminant sources.

NOTE: Many of the potential contaminant sources were located using a geocoding program where mailing addresses are used to locate a facility. Field verification of potential contaminant sources is an important element of an enhanced inventory.

Where possible, a list of potential contaminant sites unable to be located with geocoding will be provided to water systems to determine if the potential contaminant sources are located within the source water assessment area.

References Cited

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Lum II, W.E., J.L. Smoot, and D.R. Ralston, 1990. Geohydrology and Numerical Model Analysis of Ground-water Flow in the Pullman-Moscow Area, Washington and Idaho.

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Attachment A

City of Midvale
Susceptibility Analysis
Worksheet

The final scores for the susceptibility analysis were determined using the following formulas:

1) VOC/SOC/IOC Final Score = Hydrologic Sensitivity + System Construction + (Potential Contaminant/Land Use x 0.2)

2) 2) Microbial Final Score = Hydrologic Sensitivity + System Construction + (Potential Contaminant/Land Use x 0.35)

Final Susceptibility Scoring:

0 - 5 Low Susceptibility

6 - 12 Moderate Susceptibility

≥ 13 High Susceptibility

Ground Water Susceptibility Report   Public Water System Name : MIDVALE WATER SYSTEM   Well# : WELL #1

Public Water System Number 3440007   05/09/2001 8:48:58 AM

1. System Construction		SCORE
Drill Date	06/15/1962	
Driller Log Available	YES	
Sanitary Survey (if yes, indicate date of last survey)	YES	1997
Well meets IDWR construction standards	NO	1
Wellhead and surface seal maintained	NO	1
Casing and annular seal extend to low permeability unit	NO	2
Highest production 100 feet below static water level	YES	0
Well located outside the 100 year flood plain	NO	1
	Total System Construction Score	5

2. Hydrologic Sensitivity		
Soils are poorly to moderately drained	NO	2
Vadose zone composed of gravel, fractured rock or unknown	YES	1
Depth to first water > 300 feet	NO	1
Aquitard present with > 50 feet cumulative thickness	YES	0
	Total Hydrologic Score	4

3. Potential Contaminant / Land Use - ZONE 1A		IOC Score	VOC Score	SOC Score	Microbial Score
Land Use Zone 1A	IRRIGATED PASTURE	1	1	1	1
Farm chemical use high	NO	0	0	0	
IOC, VOC, SOC, or Microbial sources in Zone 1A	NO	NO	NO	NO	NO
	Total Potential Contaminant Source/Land Use Score - Zone 1A	1	1	1	1

Potential Contaminant / Land Use - ZONE 1B		IOC Score	VOC Score	SOC Score	Microbial Score
Contaminant sources present (Number of Sources)	YES	8	12	12	4
(Score = # Sources X 2) 8 Points Maximum		8	8	8	8
Sources of Class II or III leacheable contaminants or	YES	8	7	4	
4 Points Maximum		4	4	4	
Zone 1B contains or intercepts a Group 1 Area	NO	0	0	0	0
Land use Zone 1B	Greater Than 50% Irrigated Agricultural Land	4	4	4	4
	Total Potential Contaminant Source / Land Use Score - Zone 1B	16	16	16	12

Potential Contaminant / Land Use - ZONE II		IOC Score	VOC Score	SOC Score	Microbial Score
Contaminant Sources Present	YES	2	2	2	
Sources of Class II or III leacheable contaminants or	YES	1	1	1	
Land Use Zone II	Greater Than 50% Irrigated Agricultural Land	2	2	2	
	Potential Contaminant Source / Land Use Score - Zone II	5	5	5	0

Potential Contaminant / Land Use - ZONE III		IOC Score	VOC Score	SOC Score	Microbial Score
Contaminant Source Present	YES	1	1	1	
Sources of Class II or III leacheable contaminants or	YES	1	1	1	
Is there irrigated agricultural lands that occupy > 50% of	YES	1	1	1	
	Total Potential Contaminant Source / Land Use Score - Zone III	3	3	3	0

Cumulative Potential Contaminant / Land Use Score	25	25	25	13
4. Final Susceptibility Source Score	14	14	14	14
5. Final Well Ranking	High	High	High	High

1. System Construction		SCORE
Drill Date	08/31/1953	
Driller Log Available	YES	
Sanitary Survey (if yes, indicate date of last survey)	YES	1997
Well meets IDWR construction standards	NO	1
Wellhead and surface seal maintained	NO	1
Casing and annular seal extend to low permeability unit	NO	2
Highest production 100 feet below static water level	YES	0
Well located outside the 100 year flood plain	NO	1
Total System Construction Score		5

2. Hydrologic Sensitivity		
Soils are poorly to moderately drained	NO	2
Vadose zone composed of gravel, fractured rock or unknown	YES	1
Depth to first water > 300 feet	NO	1
Aquitard present with > 50 feet cumulative thickness	YES	0
Total Hydrologic Score		4

3. Potential Contaminant / Land Use - ZONE 1A		IOC Score	VOC Score	SOC Score	Microbial Score
Land Use Zone 1A	IRRIGATED PASTURE	1	1	1	1
Farm chemical use high	NO	0	0	0	
IOC, VOC, SOC, or Microbial sources in Zone 1A	NO	NO	NO	NO	NO
Total Potential Contaminant Source/Land Use Score - Zone 1A		1	1	1	1
Potential Contaminant / Land Use - ZONE 1B					
Contaminant sources present (Number of Sources)	YES	8	11	11	4
(Score = # Sources X 2) 8 Points Maximum		8	8	8	8
Sources of Class II or III leacheable contaminants or	YES	8	7	4	
4 Points Maximum		4	4	4	
Zone 1B contains or intercepts a Group 1 Area	NO	0	0	0	0
Land use Zone 1B	Greater Than 50% Irrigated Agricultural Land	4	4	4	4
Total Potential Contaminant Source / Land Use Score - Zone 1B		16	16	16	12
Potential Contaminant / Land Use - ZONE II					
Contaminant Sources Present	YES	2	2	2	
Sources of Class II or III leacheable contaminants or	YES	1	1	1	
Land Use Zone II	Greater Than 50% Irrigated Agricultural Land	2	2	2	
Potential Contaminant Source / Land Use Score - Zone II		5	5	5	0
Potential Contaminant / Land Use - ZONE III					
Contaminant Source Present	YES	1	1	1	
Sources of Class II or III leacheable contaminants or	YES	1	1	1	
Is there irrigated agricultural lands that occupy > 50% of	YES	1	1	1	
Total Potential Contaminant Source / Land Use Score - Zone III		3	3	3	0

Cumulative Potential Contaminant / Land Use Score	25	25	25	13
4. Final Susceptibility Source Score	14	14	14	14
5. Final Well Ranking	High	High	High	High